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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,621	01/10/2002	Young-Sin Park	030681-346	5259
21839	7590	11/15/2004	EXAMINER	
BURNS DOANE SWECKER & MATHIS L L P			CREPEAU, JONATHAN	
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ALEXANDRIA, VA 22313-1404			PAPER NUMBER	
			1746	
DATE MAILED: 11/15/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/041,621

Applicant(s)

PARK ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. This Office action addresses claims 1-13. The translation of the priority document is sufficient to remove JP 2001-256967 as prior art. However, the claims are newly rejected under 35 USC §103 herein, as necessitated by amendment. Accordingly, this action is made final.

### *Claim Rejections - 35 USC § 103*

2. Claims 1, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-86854 in view of Kanematsu et al (U.S. Patent 6,602,354).

Regarding claim 1, JP '854 teaches an anode material comprising an intermetallic material comprising a lithium-storing phase and a non-lithium storing phase (see abstract). The lithium storing phase is preferably Al, Si, Sn, or Pb (see paragraph 11 of the machine translation). The non-lithium storing phase is preferably Cr, Fe, Co, Ni, or Cu (see paragraph 16). These disclosures are considered to be anticipatory of an Ni-Sn intermetallic material. Further, the thin film anode comprises a current collector (see paragraph 20). Regarding claim 11, the anode is used in a lithium ion battery (see paragraph 11).

JP '854 does not expressly teach that the intermetallic compound is heat-treated in the range of 300-500 degrees C, as recited in claim 1.

Kanematsu et al. is directed to a method for producing a tin-nickel alloy film. In the method, the materials are heated in a range of about 232-400 degrees C (see col. 2, lines 43-51).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to apply the heat treatment of Kanematsu et al. to the intermetallic compound of JP '854. In column 2, line 3, Kanematsu et al. teach the following:

Therefore, even though the non-equilibrium NiSn phase is generated, it is shifted to another stable NiSn phase in the heat-diffusion process of the present invention. As a result, since the thus obtained tin-nickel alloy film does not have the non-equilibrium NiSn phase, different from the above electroplated tin-nickel alloy film, it can maintain its original properties in use, and the original functions given to the tin-nickel alloy film can be maintained for a long time.

As such, the artisan would be sufficiently motivated to apply the heat treatment of Kanematsu et al. to the intermetallic compound of JP '854.

3. Claims 1, 2, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bito et al (U.S. Patent 6,265,111) in view of Kanematsu et al.

Regarding claim 1, Bito teaches a thin film anode comprising a current collector and an anode material comprising an Sn-Ni intermetallic compound thereon (see abstract; col. 3, line 32). Regarding claims 2, 10, and 12, the intermetallic compound can be  $\text{Ni}_3\text{Sn}_4$  (see Table 1, line 8). Regarding claim 11, the anode is used in a lithium ion battery (see abstract). Regarding claim 9, the anode material may be made by a mechanical alloying method and an ion-beam assisted deposition method (see col. 6, line 43 et seq.).

Although Bito teaches that some particles having surface coatings are heat treated (see Example 3 and Table 4), Bito does not expressly teach that the  $\text{Ni}_3\text{Sn}_4$  intermetallic compound is heat-treated in the range of 300-500 degrees C, as recited in claim 1.

Kanematsu et al. is directed to a method for producing a tin-nickel alloy film. In the method, the materials are heated in a range of about 232-400 degrees C (see col. 2, lines 43-51).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to apply the heat treatment of Kanematsu et al. to the intermetallic compound of Bito. In column 2, line 3, Kanematsu et al. teach the following:

Therefore, even though the non-equilibrium NiSn phase is generated, it is shifted to another stable NiSn phase in the heat-diffusion process of the present invention. As a result, since the thus obtained tin-nickel alloy film does not have the non-equilibrium NiSn phase, different from the above electroplated tin-nickel alloy film, it can maintain its original properties in use, and the original functions given to the tin-nickel alloy film can be maintained for a long time.

As such, the artisan would be sufficiently motivated to apply the heat treatment of Kanematsu et al. to the intermetallic compound of Bito.

4. Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bito et al. in view of Kanematsu et al. as applied to claims 1, 2, and 9-13 above, and further in view of JP 4-308081.

Bito further teaches that the manufacturing methods include ion beam "sputtering" and vacuum vapor deposition (col. 6, line 46). However, Bito et al. do not expressly teach that the

sputtering is mosaic sputtering (claim 3), co-sputtering (claim 5), or single-target sputtering (claim 7).

JP 4-308081 is directed to a sputtering target. As disclosed in the Derwent abstract, the target is a “mosaic” target that comprises pieces of two different compositions assembled on a single base plate. The compositions are elemental metals.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the sputtering target of JP ‘081 to form the anode material of Bito et al. In the JPO abstract, the reference teaches that the purpose of the invention is “to reduce the fraction defective of products by specifying the percentage of single crystals and/or macro-grains of the constituents of a target.” Further, the abstract teaches that “the productivity of the target can be improved.” As such, the artisan would be motivated to use the sputtering target of JP ‘081 (modified to include Sn and Ni) to form the anode material of Bito et al. The target of JP ‘081 is considered to render obvious all the limitations of the instant claims, i.e., it can be used in mosaic sputtering, co-sputtering, and single target sputtering (since the target as a whole can be considered to be a “single” target).

### ***Response to Arguments***

5. Applicant’s arguments filed August 20, 2004 have been fully considered but they are not persuasive. Applicants assert that JP ‘854 discloses “laundry lists” of elements suitable for use in the intermetallic compound, and as such, JP ‘854 does not anticipate or render obvious the

claimed NiSn compound. However, as noted in the rejection above, the preferred elements are Al, Si, Sn, or Pb (first element), and Cr, Fe, Co, Ni, or Cu (second element). The fact that these elements are disclosed as being preferred would provide sufficient guidance for an artisan to use them in various combinations. Further, the lists of preferred elements contain relatively few (i.e., four or five) members and therefore are not believed to constitute "laundry lists." It is noted that the reference teaches an NiSi material in paragraph 12. Since Al, Si, Sn, or Pb are all disclosed as being preferred first elements, the artisan may reasonably conclude that Si is functionally equivalent to Sn, Al, and Pb. As such, this disclosure is considered to fairly suggest an NiSn compound. If Applicant wishes to submit evidence showing that Sn performs better than Al, Si, or Pb in an intermetallic compound with Ni, such evidence would be considered by the Examiner.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

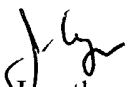
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
November 10, 2004